

REMARKS

Claims 25 to 50 are pending in this application, all of which have been finally rejected. Claims 25, 29 and 46 are amended herein. Entry of this amendment is respectfully requested. It is respectfully submitted that no new issues are raised by this amendment.

The Rejection under 35 U.S.C. §112

Claims 25-50 are rejected under 35 U.S.C. §112, second paragraph.

In particular the Office Action states that it is not apparent as to which specific "spatial distribution" is referred to in the preamble of the independent claims 25, 29 and 46. These claims are amended herein to recite that presence, spatial distribution and amount of the chemical species is in a surrounding medium. The surrounding medium can be, for example, soil or a well into which the capillary of the invention is positioned. (See, specification, page 9, paragraph [0026]).

The Office Action states that it is not clear what might be "at least a chemical species". Applicants respectfully disagree with the assertion of the Examiner that the phrase "at least a chemical species" is unclear. As evidence, applicants point to U.S. Patent No. 6,676,903 which issued in the parent application of which the present application is a divisional. Independent claims 1, 5 and 24 each include the phrase "at least a chemical species" in the preamble. As these claims are considered to be of sufficient clarity to merit allowance, the claims herein are also submitted to be of sufficient clarity. However, to advance prosecution in this application claims 25, 29 and 46 are amended to recite "at least one chemical species."

The Office Action states that it is not clear how steps (4) and (5) are performed. Claims 25, 29, and 46 are amended to include a new step (4) directed to positioning the capillary containing the fluid medium in the surrounding medium at a location where the chemical species is suspected to be present. Support for this recitation may be found in the specification, for example, at page 9, paragraph [0026], and at least implicitly in the claims originally filed. Step (5) (formerly step 4) is recites that the fluid medium resides in the capillary allow the chemical species to permeate through the capillary wall into the fluid medium in a region of the fluid medium corresponding to the location in the surrounding medium where the chemical species is present. These modifications to the claims are submitted to overcome any ambiguity or lack of clarity as to what the method of the invention entails. These steps do not require recitation of a specific design of an apparatus not disclosed in the specification as alleged in the Office Action.

The Office Action states that the phrase "measuring a time at which said characteristic is detected" is unclear. Claims 25, 29 and 46 are amended to additionally recite in step (8) [originally step 7] the phrase "determining the length of travel time for the region of the fluid medium containing the chemical species to reach the detector." It is respectfully submitted that step (8) is clear to one skilled in the art.

The Office Actions states that it is not clear what "spatial distribution of said interaction within the capillary" refers to. Please note that the term "interaction" had been changed to "product" in the previous amendment. Step (9), originally step (8), is amended herein to recite

that the travel time is related to the spatial distribution of product in the capillary and the corresponding spatial distribution of the chemical species in the surrounding medium.

It is respectfully submitted that any informalities in the claims have been corrected by the amendments herein. Reconsideration and withdrawal of the rejection are respectfully requested.

The Rejection under Prior Art

1. Claims 25-39, 46, and 48-50 are rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,434,084 (hereinafter, "Burgess, Jr."). Burgess, Jr. is directed to a device for continuously measuring the presence and concentration of an analyte.

The Burgess, Jr. device uses a flowing reagent that reacts with the analyte and the reaction product is detected with an optical sensor. However, the Burgess, Jr. device and method differ from the claimed invention in several important respects.

First, the Burgess, Jr. device is adapted for continuous measurement of the presence and concentration of the analyte in a liquid or gas in a process stream. Secondly, the Burgess, Jr. device does not determine the spatial distribution of the analyte in the liquid or gas. In contrast to this, the method of the present invention requires the fluid medium in the capillary to temporarily remain stationary to allow the chemical species to permeate through the wall of the capillary into the fluid medium in a region of the fluid medium which corresponds to the location of the chemical species in the surrounding medium. Then, the content of the capillary is transferred to the detector (under plug flow conditions) so that the regions of the fluid medium into which the chemical species have permeated are sequentially detected and measured. The

travel time it takes for the individual regions to reach the detector are indicative of the where the corresponding regions were in the capillary during the step of allowing the chemical species to permeate into the fluid medium. This, in turn, indicates the location and spatial distribution of the chemical species in the surrounding medium. Burgess, Jr. describes the method of using his device as follows:

The present invention is further directed to a method for continuously measuring the presence and concentration of an analyte or analytes in a liquid or gas. Preferably, the method involves measuring the presence and concentration of an analyte or analytes in a liquid or gas process stream. The method comprises contacting the sensor probe with a liquid or gas, adjusting the flow rate of the reagent into the sensor probe which adjusts the sensitivity and useable measurement range of the sensor probe, and detecting the presence and concentration of the analyte or analytes by measuring the reaction product of the reagent and the analyte or analytes according to a modulation of electromagnetic radiation or by chemiluminescence.

Burgess, Jr. Col 5, lines 1-6.

The operation of the Burgess, Jr. device is clearly different in method and purpose from the claimed invention. In the Burgess, Jr. method the external medium, e.g. a process stream, is moving and does not allow for the determination of the spatial distribution of the analyte, which is always changing. Moreover, the Burgess, Jr. continuous mode of operation cannot be used in the present invention because that would eliminate the discrete positions of the regions where the chemical species permeated into the fluid medium, thereby rendering determination of a spatial distribution of the chemical species impossible.

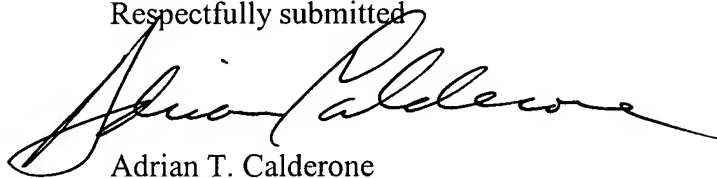
Accordingly, Burgess, Jr. neither discloses nor suggests the method of claims 25, 29 and 46, or any of the claims depending therefrom. Reconsideration and withdrawal of the rejection are respectfully requested.

2. Claims 40-45 and 47 are rejected as being obvious over Burgess, Jr. in view of U.S. Patent Nos. 4,666,672 ("Miller et al."), 5,059,790 ("Klainer et al."), 5,268,972 ("Tabacco et al."), European publication EP 928,966 ("Hohr et al."), and literature references Donner et al. (ACS Symposium), Bakaltcheva et al. (Anal. Chim. Acta), Sano et al. (Anal. Sic.), and Gladovich et al. (Zh. Anal. Khimii). The secondary references are cited for disclosing various analytes. The Office Action acknowledges that Burgess, Jr. does not specifically disclose analytes, but states that it would have been obvious to modify the Burgess, Jr. device to detecting the analytes recited in the secondary references. Whatever the merit of the combination of references suggested by the Examiner, the Burgess, Jr. patent fails to disclose or suggest the invention claimed herein for the reasons stated above. The secondary references do not make up for the deficiencies of Burgess, Jr. Accordingly, even if the references were to be combined the present invention would neither be disclosed or suggested. Reconsideration and withdrawal of the rejection are respectfully requested.

CONCLUSION

For at least the reasons stated above all of the pending claims are submitted to be in condition for allowance, the same being respectfully requested.

Respectfully submitted

A handwritten signature in black ink, appearing to read 'Adrian T. Calderone', written in a cursive style.

Adrian T. Calderone
Reg. No. 31,746
Attorney for Applicant(s)

DILWORTH & BARRESE, LLP
333 Earle Ovington Blvd.
Uniondale, NY 11553
Tel: (516) 228-8484
Fax: (516) 228-8516